

**TU**ELECTRIC

Log # TXX-97245  
File # 10200  
Ref. # 10CFR50.73(a)(2)(iv)

**C. Lance Terry**  
Group Vice President

November 24, 1997

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)-UNIT 2  
DOCKET NOS. 50-446  
MANUAL OR AUTOMATIC ACTUATION OF REACTOR PROTECTION SYSTEMS  
LICENSEE EVENT REPORT 446/97-002-00

Enclosed is Licensee Event Report (LER) 97-002-00 for Comanche Peak Steam Electric Station Unit 2, "Manual Reactor Trip Due to Failure of Rod Control System."

This communication contains no new licensing basis commitments regarding CPSES Units 1 and 2.

Sincerely,

*C. L. Terry*  
C. L. Terry

OB:ob  
Enclosure

cc: Mr. E. W. Merschoff, Region IV  
Mr. J. I. Tapia, Region IV  
Resident Inspectors

9712020151 971124  
PDR ADOCK 05000446  
S PDR



# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9712020151      DOC.DATE: 97/11/24      NOTARIZED: NO      DOCKET #  
FACIL:50-446 Comanche Peak Steam Electric Station, Unit 2, Texas U      05000446  
AUTH.NAME      AUTHOR AFFILIATION  
GULDEMOND,W.G.      Texas Utilities Electric Co. (TU Electric)  
TERRY,C.L.      Texas Utilities Electric Co. (TU Electric)  
RECIP.NAME      RECIPIENT AFFILIATION

SUBJECT: LER 97-002-00:on 971025,operator manually tripped reactor.  
Caused by failed phase sensing transformer T2 & bent card  
edge connector in regulation card.Replaced phase sensing  
transformer & restored cards to design spec.W/971124 ltr.

DISTRIBUTION CODE: IE22T      COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6  
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

### NOTES:

|           | RECIPIENT<br>ID CODE/NAME | COPIES<br>LTTR ENCL | RECIPIENT<br>ID CODE/NAME | COPIES<br>LTTR ENCL |
|-----------|---------------------------|---------------------|---------------------------|---------------------|
|           | PD4-1 PD                  | 1 1                 | POLICH,T                  | 1 1                 |
| INTERNAL: | ACRS                      | 1 1                 | AEOD/SPD/RAB              | 2 2                 |
|           | AEOD/SPD/RRAB             | 1 1                 | FILE CENTER               | 1 1                 |
|           | NRR/DE/ECGB               | 1 1                 | NRR/DE/EELB               | 1 1                 |
|           | NRR/DE/EMEB               | 1 1                 | NRR/DRCH/HHFB             | 1 1                 |
|           | NRR/DRCH/HICB             | 1 1                 | NRR/DRCH/HOLB             | 1 1                 |
|           | NRR/DRCH/HQMB             | 1 1                 | NRR/DRPM/PECB             | 1 1                 |
|           | NRR/DSSA/SPLB             | 1 1                 | NRR/DSSA/SRXB             | 1 1                 |
|           | RES/DET/EIB               | 1 1                 | RGN4 FILE 01              | 1 1                 |
| EXTERNAL: | L ST LOBBY WARD           | 1 1                 | LITCO BRYCE,J H           | 1 1                 |
|           | NOAC POORE,W.             | 1 1                 | NOAC QUEENER,DS           | 1 1                 |
|           | NRC PDR                   | 1 1                 | NUDOCS FULL TXT           | 1 1                 |

### NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS  
OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL  
DESK (DCD) ON EXTENSION 415-2083

FULL TEXT CONVERSION REQUIRED

TOTAL NUMBER OF COPIES REQUIRED: LTTR 25 ENCL 25

NRC FORM 366  
(4-95)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104  
EXPIRES 4/30/98

## LICENSEE EVENT REPORT (LER)

(See reverse for required number of  
digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC. 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC. 20503.

Facility Name (1)

COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2

Docket Number (2)

05000446

Page (3)

01 OF 05

Title (4)

MANUAL REACTOR TRIP DUE TO FAILURE OF ROD CONTROL SYSTEM

| Event Date ((5))   |     |      | LER Number (6) |  |                 | Report Date (7)      |     |                      | Other Facilities Involved (8) |                           |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|--------------------|-----|------|----------------|--|-----------------|----------------------|-----|----------------------|-------------------------------|---------------------------|---|---|---|---|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|
| Month              | Day | Year | Year           | Sequential Number  | Revision Number | Month                | Day | Year                 | Facility Name                 | Docket Numbers            |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
| 1                  | 0   | 2    | 5              | 9  | 7               | 9                    | 7   | -                    | 0                             | 0                         | 2 | - | 0 | 0 | 1 | 1 | 2 | 4 | 9 | 7 | N/A | 0 | 5 | 0 | 0 | 0 | 4 | 4 | 5 |
| Operating Mode (9) |     | 1    |                | This report is submitted pursuant to the requirements of 10 CFR 50.71 (Check one or more) (11) |                 |                      |     |                      |                               |                           |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
| Power Level (10)   |     | 10%  |                | 20.2201 (L)  |                 | 20.2203 (a) (2) (v)  |     | 50.73 (a) (2) (i)    |                               | 50.73 (a) (2) (viii)      |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|                    |     |      |                | 20.2203 (a) (1)  |                 | 20.2203 (a) (3) (i)  |     | 50.73 (a) (2) (ii)   |                               | 50.73 (a) (2) (x)         |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|                    |     |      |                | 20.2203 (a) (2) (i)  |                 | 20.2203 (a) (3) (ii) |     | 50.73 (a) (2) (iii)  |                               | 73.71                     |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|                    |     |      |                | 20.2203 (a) (2) (ii)   |                 | 20.2203 (a) (4)      |     | X 50.73 (a) (2) (iv) |                               | OTHER                     |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|                    |     |      |                | 20.2203 (a) (2) (iii)  |                 | 50.36 (c) (1)        |     | 50.73 (a) (2) (v)    |                               | Specify in Abstract below |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|                    |     |      |                | 20.2203 (a) (2) (iv)   |                 | 50.36 (c) (2)        |     | 50.73 (a) (2) (vi)   |                               | or in NRC Form 366A       |   |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |

Licensee Contact For This LER (12)

Name

W.G. Guldmond - Shift Operations Manager

Telephone Number (Include Area Code)

(254)897-8739

Complete One Line For Each Component Failure Described in This Report (13)

| Cause | System | Component | Manufacturer | Reportable To NPRDS | Cause | System | Component | Manufacturer | Reportable To NPRDS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
|       |        |           |              | N                   |       |        |           |              |                     |
|       |        |           |              |                     |       |        |           |              |                     |
|       |        |           |              |                     |       |        |           |              |                     |

Supplemental Report Expected (14)

|  |   |    |                               |       |     |      |
|--|---|----|-------------------------------|-------|-----|------|
| YES<br>(If yes, completed EXPECTED SUBMISSION DATE). | X | NO | EXPECTED SUBMISSION DATE (15) | Month | Day | Year |
|  |   |    |                               |       |     |      |

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 25, 1997, Comanche Peak Steam Electric Station Unit 2 was in Mode 1 and had commenced a Unit shutdown in preparation for the third refueling outage. At approximately 12:17 a.m., prior to the event, troubleshooting efforts were in progress for a phase failure indication associated with the moveable coils for control rod Bank C. At approximately 4:04 a.m., attempt was made to move Bank C. When the Reactor Operator (Utility, Licensed) placed the In-Hold-Out switch to the "out" position, a Rod Control Urgent Failure alarm was received and an indication of four dropped rods. The Reactor Operator manually tripped the reactor based on the indication of 4 dropped rods. All rods fully inserted when the Reactor Trip Breakers opened.

TU Electric concluded that a failure of phase sensing transformer T2 within the rod control cabinet 2AC generated the first fault resulting in an urgent failure alarm. Subsequent troubleshooting resulted in replacement of regulation card. The replaced regulation card had a bent pin which caused the actual dropped rods. The bent pin was possibly caused during insertion of the regulation card. The Phase Sensing Transformer T2 has been replaced. Additional corrective actions including inspection/refurbishment of the rod control system with respect to rod control system are complete.

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|  |                        |                |   |                   |   |                 |   |          |    |   |    |    |    |
|--|------------------------|----------------|---|-------------------|---|-----------------|---|----------|----|---|----|----|----|
| Facility Name (1)<br><br>COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2 | Docket<br><br>05000446 | LER Number (6) |   |                   |   |                 |   | Page (3) |    |   |    |    |    |
|  |                        | Year           |   | Sequential Number |   | Revision Number |   |          | OF |   |    |    |    |
|  |                        | 9              | 7 | .                 | 0 | 0               | 2 | .        | 0  | 0 | 02 | OF | 05 |

Text (if more space is required, use additional copies of NRC Form 366A) (17)

## I. DESCRIPTION OF THE REPORTABLE EVENT

### A. REPORTABLE EVENT CLASSIFICATION

An event or condition that resulted in a manual automatic actuation of any Engineered Safety Features (ESF) including the Reactor Protection System (RPS).

### B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On October 25, 1997, prior to the event, Comanche Peak Steam Electric Station (CPSES) Unit 2 was in Mode 1, Power Operation, with reactor power at 10 percent in preparation for its third refueling outage.

### C. STATUS OF STRUCTURE, SYSTEMS, OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

There was a fault in a phase sensing transformer which caused the urgent rod control failure alarm. Trouble shooting was being performed on the rod control system.

### D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROPRIATE TIMES

At approximately 2:50 a.m., on October 25, 1997, an urgent failure alarm was received when control bank C group 2 was stepped, after a Regulation card for the movable coil was replaced. At approximately 4:04 a.m., on October 25, 1997, following replacement of another card another attempt to move the control rods was made. The group position indication indicated that the control bank C group 2 stepped out to an indicated position of 232 steps. Group 1 rods did not step when demanded. A digital rod position indication rod deviation alarm was received. The digital rod position indication system indicated that Rod F6 was on the bottom and rods F10, K10 and K6 had dropped to approximately 198 steps. The Unit 2 Reactor Operator (Utility, Licensed) manually tripped the reactor.

An event or condition that results in an automatic or manual actuation of any ESF, including the RPS, is reportable within 4 hours pursuant to the requirements of 10CFR50.72(b)(2)(ii). At 4:30 a.m. on October 25, 1997, the Nuclear Regulatory Commission Operations Center was notified of the event via the Emergency Notification System.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

|   |          |                |   |                   |   |                 |   |          |    |    |    |
|---|----------|----------------|---|-------------------|---|-----------------|---|----------|----|----|----|
| Facility Name (1)                           | Docket   | LER Number (6) |   |                   |   |                 |   | Page (3) |    |    |    |
| COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2 | 05000446 | Year           |   | Sequential Number |   | Revision Number |   |          |    |    |    |
|   |          | 9              | 7 | .                 | 0 | 0               | 2 | .        | 0  | 0  |    |
|   |          |                |   |                   |   |                 |   |          | 03 | OF | 05 |

Text (if more space is required, use additional copies of NRC Form 366A) (17)

## E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE, OR PROCEDURAL OR PERSONNEL ERROR

A digital rod position indication rod deviation alarm was received which alerted the reactor operator to the dropped control rods.

II. COMPONENT OR SYSTEM FAILURES

## A. FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT

Phase sensing transformer T2, which supplies power/phase control to the B phase of bank C group 2 power cabinet cards and control rod coils was found to be defective.

## B. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

The cause of transformer T2 failure is not known.

TU Electric believes that during the card replacement, a pin on the replacement regulation card was bent, this caused a problem with the regulation of the movable circuit voltage. This caused the rods to drop when the operator attempted rod movement. The degraded movable gripper voltage was not enough to fully engage the movable gripper. The stationary gripper opened as part of the step sequence. As the rods began to fall due to unavailability of the movable gripper, the urgent failure alarm applied the stationary gripper voltage which caught three of the four rods.

## C. SYSTEMS OR SECONDARY FUNCTIONS THAT WERE AFFECTED BY FAILURE OF COMPONENTS WITH MULTIPLE FUNCTIONS

Not applicable - No failures of components with multiple functions have been identified.

III. ANALYSIS OF THE EVENT

## A. SAFETY SYSTEM RESPONSES THAT OCCURRED

Both Motor Driven Auxiliary Feedwater Pumps were manually started.



# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|   |          |                |   |   |                      |   |   |                    |   |   |    |    |    |
|---|----------|----------------|---|---|----------------------|---|---|--------------------|---|---|----|----|----|
| Facility Name (1)                           | Docket   | LER Number (6) |   |   |                      |   |   | Page (3)           |   |   |    |    |    |
| COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2 | 05000446 | Year           |   |   | Sequential<br>Number |   |   | Revision<br>Number |   |   |    |    |    |
|   |          | 9              | 7 | . | 0                    | 0 | 2 | .                  | 0 | 0 |    |    |    |
|   |          |                |   |   |                      |   |   |                    |   |   | 04 | OF | 05 |

Text (if more space is required, use additional copies of NRC Form 366A) (17)

## B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

No safety system trains were inoperable during this transient.

## C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The event consisted of a multiple control rod drop leading to a manual reactor trip. This is bounded by FSAR, Section 15.4.3 which concludes that the successful automatic actuation of the reactor trip will ensure there is no reduction in the margin to core thermal limits and that the departure from nucleate boiling design basis is met. As the reactor was manually tripped immediately upon detection of dropped rods, there were no adverse impacts to plant safety or the health and safety of the public.

## IV. CAUSE OF THE EVENT

The cause of the event was deemed to be a failed phase sensing transformer T2, and a bent card edge connector in the regulation card.

## V. CORRECTIVE ACTIONS

The defective phase sensing transformer has been replaced. Additionally, as part of the normal refueling outage work, the rod control printed circuit cards were groomed with a dynamic testing system, and components were replaced to restore cards to design specifications.

Subsequent to the rework/repair, the card edge connectors were verified to be working properly as part of this grooming process.

## VI. PREVIOUS SIMILAR EVENTS

There have been previous events which involved dropped rods. However, the causes of these events were sufficiently different, such that the corrective actions for the previous events would have not prevented the October 25, 1997 event.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

|  |                    |                |   |                   |   |                 |   |          |    |    |
|--|--------------------|----------------|---|-------------------|---|-----------------|---|----------|----|----|
| Facility Name (1)<br>COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2 | Docket<br>05000446 | LER Number (6) |   |                   |   |                 |   | Page (3) |    |    |
|  |                    | Year           |   | Sequential Number |   | Revision Number |   | 05       | OF | 05 |
|  |                    | 9              | 7 | -                 | 0 | 0               | 2 | -        | 0  | 0  |

Text (if more space is required, use additional copies of NRC Form 366A) (17)

VII. ADDITIONAL INFORMATION

All times provided are approximated and are Central Daylight Time.